Second SEDAR

(South East Data, Assessment and Review)

Draft

Advisory Report

on the status of the stocks of

Vermilion Snapper and Black Sea Bass from the south east of the U.S.

Second SEDAR Review Panel Workshop
RALEIGH, NC 27605
February 25 – 28, 2003

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I. Vermilion Snapper

1. Status of Stock

The assessment indicates that overfishing is occurring but that the stock is not currently overfished. However, SFA benchmarks are estimated from the stock-recruitment relationship, in which the SEDAR Review Panel did not have confidence.

The estimate of the current fishing mortality, F, is taken as the average F over the last 3 years (F_{proj}=0.44/yr). F_{proj} is considered to be a robust prediction of current F because it reduces the influence of uncertainty about recent recruitment. F_{proj} was consistently above the F_{MSY} and F_{max} values under the full range of sensitivity runs.

There is a high level of uncertainty in determining whether or not the stock is overfished. The SEDAR Review Panel concluded that the stock was not overfished by restricting its attention to points E, D, H, and G in the phase plot of status indicators (Figure 19[1]). These four points reflect the uncertainty in the stock-recruitment relationship by spanning a wide range for steepness[2] (0.7-0.95) and the most likely range for natural mortality (0.25-0.3/yr).

2. Biological Reference Points

Previous Assessment
According to the existing pre-SFA overfishing definition, vermilion snapper are overfished if the SPR is less than 30%. The most recent estimate of SPR (prior to the current assessment) was 21-27%, which means that, using this definition, vermilion snapper should be considered overfished.

[1] References to tables and figures refer to the tables and figures presented in the corresponding report from the Assessment Workshop.
[2] The "steepness" of the stock-recruitment relationship, which was used in the model, is a value that can range from 0.2 to 1.0 and is the fraction of the virgin recruitment that will recruit to the fishery when the spawning stock is reduced to 20% of its virgin level. If steepness is 0.2, recruitment is directly proportional to the size of the spawning stock, whereas if steepness is 1.0, recruitment is constant and independent of the size of the spawning stock.

Current assessment
The Review Panel advises the following –

1. Use F_{max} (currently estimated as 0.35/yr) as a proxy for F_{msy} (MFMT);
2. Therefore, the proxy for MSY may be taken as the yield associated with F_{max};
3. Estimates of MSST are poorly determined and range from 185 billion to 378 billion eggs, for values of steepness ranging from 0.7 to 0.95 and of the natural mortality rate ranging from 0.25 to 0.3 per year.

3. Forecast

If recruitment occurs at or above the estimated average levels for the 1983-98 time period (as used in projections), and the fishing mortality rate is maintained at the current level (F_{proj}), then the stock biomass is likely to increase over the next few years. Although F_{proj} was consistently above F_{max}, above average annual recruitment was experienced between 1983-98, thus producing the projected increase in biomass.

4. Special Comments

The estimated abundance indices used in the assessment of this stock are based on a limited spatial coverage that does not fully reflect the entire stock. In the short-term, information from the commercial fishery on the abundance of larger vermilion snapper should be examined. Over the long-term, fishery independent sampling should be expanded. Attention should also be given to developing a recruitment index.

Effective monitoring of stock status will require more and improved data on discards. It is recommended that the bycatch logbook be continued and expanded estimates provided.

5. Source of Information

Report of Vermilion Snapper Assessment Workshop, January 6-10, 2003.

In addition, a Data Workshop was held during October 7-10, 2002. All data, reports, and results are included on a CD available from the NMFS Beaufort Lab.

II. Black Sea bass

1. Status of Stock

Overfishing is occurring and the stock is overfished, based upon the best available data used in the assessment.

The best estimate of fully-selected F_{2001} was 1.04/yr (range 0.89 – 2.00/yr). The best estimate of the January 1, 2002 spawning biomass was 1755 mt (range 766 – 2715 mt).

2. Biological Reference Points

Previous Assessment
Existing BRP previously approved by the Council - The timetable for rebuilding black sea bass effectively was reset on December 2, 1999, when the SFA Comprehensive Amendment was implemented in regulations. The regulations require that the black sea bass stock be rebuilt above the B_{msy} level (*i.e.*, the biomass must be above the biomass capable of producing the MSY), which was specified as 5.31 million pounds by December 2, 2009 (based on a 10 year rebuilding timeframe). Based on data through 1995, the spawning stock biomass/MSST ratio was estimated at 0.54, which suggested that the stock was below the MSST and therefore overfished. The fishing mortality through 1995 was 0.97/yr, which was above the MFMT (0.72/yr), and therefore black sea bass were experiencing overfishing.

Current assessment
The panel advises the following –
The base-run estimates and their extreme range obtained from the alternative sensitivity runs are reported below. Note that choosing within the range should be done on a run-by-run basis; see Tables 6.2 and 8.1 in the Report of the Black Sea bass Stock Assessment Workshop. Each of the runs is associated with the assigned probability specified in the assessment document (Table 6.1). In general, the range results from the minimum and maximum bounds of the sensitivity runs, some of which may be unlikely to represent the current stock status. The base run represents the central case, and is considered to provide the most likely set of results.

The BRPs varied considerably in the various sensitivity runs:
1. MSY = 1730 mt (range 987 – 3580 mt)
2. MFMT = 0.04/yr (range 0.002 – 0.99), based on the default control rule. If the council were to choose another control rule, the MFMT would need to be re-specified. The Council instead might choose to use $F_{rebuild}$.
3. MSST = 9460 mt (1830 – 30700 mt)
4. Bmsy = 13500 mt (range of 3050 – 38300 mt)
5. F_{2001}/F_{MSY} = 5.22 (0.94 – 22.23)
6. SSB_{2002}/SSB_{MSY} = 0.13 (0.02 – 0.89)
7. Rebuilding timeframe = 18 years based on the base run with $F_{rebuild}$ = 0.16/yr (range 0.10 – 0.49)

3. Forecast

Using values from the central run as a starting point, the stock could not recover in 10 years with F=0. The rebuilding time calculated from the generation time is 18 years (see Table 8.1)

4. Special Comments

The fisherman on the panel with extensive experience over the past 20 years fishing for black sea bass has not observed similar declines in his catches. Consequently, he does not believe the model results. There may be some mixing of the northern and southern stocks, which should be considered in future assessments.

The commercial data should be examined to determine whether an abundance index based on them would add to the accuracy or precision of future assessments.

The BRPs and projections are based on total mature biomass. There is uncertainty whether mature female biomass, or some other measure of reproductive potential, should be used as an alternative. Further examination of this issue is recommended. The computation of female spawning biomass in the present assessment may be misleading, and methodology for computing female biomass should be reassessed.

Effective monitoring of stock recovery will require adequate data on discards from all fishery segments.

The Council should note that estimated abundance trends over time appear highly dependent on the headboat index, which is a fishery-dependent dataset and is the only long-term index. The fisheries literature contains substantial evidence that fishery-dependent indices can at times underestimate the degree of decline in a stock because they do not follow a simple linear relationship with stock size. By targeting local concentrations (patches) of fish that they find based on their expert knowledge, fishers can often maintain a relatively high catch per unit effort even when the overall abundance is in decline. This is especially the case for species that aggregate in structured habitats (*e.g.,* reef fish), or schooling fish that can be located by sophisticated acoustic fish finding equipment. Well-designed fisheries-independent surveys tend to provide more representative estimates of fish abundance because they cover a wider range of habitats and density levels. For such reasons, the fisheries-independent data should receive higher weighting as the time series increases.

5. Source of Information

Report of Black Seabass Assessment Workshop, January 6-10, 2003.

In addition, a Data Workshop was held during October 7-10, 2002. All data, reports, and results are included on a CD available from the NMFS Beaufort Lab.